

SECTION 4 SANITARY SEWER SYSTEMS

4.1 General Requirements.

Sanitary sewer systems shall be designed, constructed, and tested in accordance with the current editions of the Montana Department of Environmental Quality Circulars, the Montana Public Works Standard Specifications and the City of Whitefish Engineering Standards. All sewers shall be designed as a gravity sewer whenever physically feasible. Standard Details 31-36 are the sanitary sewer details that must be included, where applicable, in sewer system construction drawings. The following shall apply to the design of all sanitary sewers:

Design Report - Gravity Sewers. Unless waived by the City Engineer, the Design Engineer shall submit a written report for all sanitary sewer extensions. The design report shall demonstrate that all sanitary sewer extensions have adequate capacity to convey wastewater from the anticipated service area and meet the minimum flow velocities and/or flow depth requirements in Chapter 30 of MDEQ Circular-2. The report shall also assess the impact on the Wastewater Treatment Plant.

Dead End Sewer Mains. Avoid dead end sewer mains with few (<4) services and no potential for future extension. Avoid locating manholes outside of roadway right-of-ways.

Quality of Sewage. No development shall introduce any sewage into the City of Whitefish sewerage facility that is not consistent with normal domestic sewage. The sewage must arrive at the Wastewater Treatment Plant in a non-septic condition. No storm water shall discharge to any sanitary sewer.

Velocity. The minimum velocity, in either gravity or force mains, shall be two (2) feet per second, based on a flowing full condition on gravity mains. The maximum velocity shall be ten (10) feet per second, unless otherwise approved by the City.

Minimum Depth. Sanitary sewers shall be buried to a depth sufficient to prevent freezing and shall have a minimum four (4) feet of cover. Shallower depths may be allowed by the Public Works Department if suitable pipe insulating provisions have been made.

Accessibility. Sewer mains shall be installed in public right-of-way wherever possible. All sewer facilities shall be designed and constructed so that all such facilities are readily accessible for maintenance and repair. Where mains cannot be installed in the ROW, a 20-foot wide easement shall be provided with the pipe centerline five (5) feet from one easement edge.

Manhole Spacing. The maximum spacing between manholes shall be 400 feet for sewer main at slopes of 0.4% - 4%, 300 feet for sewer main at slopes of 4% - 8%, and 200 feet at slopes greater than 8%.

Service Line Separation. A minimum of 10' horizontal separation must be provided between sewer and water service lines.

Garage Floor Drains. No direct connection of garage floor drains shall be allowed to the sanitary sewer service line.

Force Main Cleanouts. Pressure type cleanouts, of the same size as the force main, shall be provided at approximate 600 foot intervals along a force main unless approved by the City Engineer. A removable cap for the force main cleanout shall also be tapped for and fitted with a one (1) inch threaded plug. The force main shall be equipped with a plug valve and valve box immediately upstream of each force main cleanout.

Sewer Hookup Requirement. Sewer hookup is required for new construction if the proposed building is within 500 feet of a property served by sewer or within 500 feet of a City sewer main.

4.2 Material Specifications.

- Pipe Size. Sewer mains shall be sized for the ultimate development of the tributary area. Nothing shall preclude the City from requiring the installation of a larger sized main if the City determines a larger size is needed to meet the requirements for future service. Joint participation by the City may be applicable where oversizing is deemed appropriate by the City Engineer. The minimum diameter of any gravity sanitary sewer main shall be eight (8) inches.
- Gravity Sewer Main. Gravity sewer main material shall be PVC SDR 35.
- Pressure Sewer Main. Pressure sewer main (force mains) shall consist of HDPE SDR 11 or approved equal with butt fusion joints.
- Gravity Sewer Service Pipe. Gravity sewer service pipe shall be schedule 40 PVC. The terminal end of sanitary sewer services at undeveloped lots shall be marked in accordance with Standard Detail 31.
- Pressurized Sewer Service. Pressurized sewer service pipe shall be HDPE SDR11 or approved equal.
- Sanitary Sewer Service Lines. Structures containing two or more residences under separate ownership, such as townhouses or condominiums, shall have separate sewer service lines for each residence. Structures containing two or more residences, offices or

businesses that are rental units under common ownership may have one service line for all occupants within a single structure subject to approval by the City.

- Sanitary Sewer Manholes. All sanitary sewer manholes shall be constructed and installed as specified by the Montana Public Works Standard Specifications. In addition, all sanitary sewer manholes sections shall be sealed with an exterior rubberized joint seal meeting ASTM C-877, type II with a minimum width of nine (9) inches. (See Standard Details 32a & 32b). Avoid locating manholes outside of road right-of-ways. Avoid dead end sewer mains with few services and no potential for future extensions.
- Sewer Saddle. Sewer saddles shall be Romac Saddle: CB-4.63 U.N (for any main type) or PVC Saddle: O-ring/gasket seal w/stainless steel clamps (PVC main only).
- Gravity Main Cleanouts. Gravity main cleanouts shall not be permitted unless the Engineer shows that conditions exist as described in the MDEQ Circular 2, 34.1 (allowing cleanouts in special situations and at the end of mains less than 150 feet in length with no services installed and available for future extension).
- Sanitary Sewer Manhole Ring and Cover. The sanitary sewer manhole ring and cover shall be East Jordan Iron Works Model 3772Z1, or approved equal. The cover shall be marked Sewer. Manholes located within the paved sections of roadways or driveways or in areas subject to flooding shall have approved infiltration pans installed.
- Adjustment Rings. All adjustment rings shall only be composed of concrete or high density polyethylene (HDPE). No rocks, asphalt, wood shims or any foreign material shall be used to adjust rings. No more than two (2) adjustment rings shall be used per each manhole grate. Combinations of adjustment rings shall have a total height of more than two (2) inches and less than ten (10) inches. All grate and adjustment ring combinations shall be sealed with a rubberized chimney seal meeting the specifications of ASTM C-923 and shall have of a minimum thickness of 3/16 inches.
- Warning Tape for Force Mains. Detectable warning tape shall be a minimum of 5 mils thick, three inches wide and conform to APWA colors.
- Toner Wire for Force Mains. All force mains shall be laid with 12 gauge insulated solid core copper toner wire. Toner wire shall be insulated and taped to the top of the force main. Splices of toner wire shall be made with heat shrink tape.
- Testing. Testing of the manholes, sewer lines or force mains must be done in accordance with the Montana Department of Environmental Quality Circulars and the Montana Public Works Standard Specifications.

- Dog house Manholes. Dog house type manholes are not allowed when connecting to an existing sewer main unless approved by the Public Works Director.
- Television Inspection. Prior to the City's acceptance of the sewer system the Contractor must provide television inspection of the system. The cost of television inspection will be the responsibility of the Contractor. If any deficiencies are found during the inspection, the Contractor shall correct them at the contractor's expense.
- Oil/Water Separators. Automotive repair facilities and paint shops, dealerships, gas stations, equipment degreasing areas, and other facilities generating wastewater with oil and grease content are required to pretreat these wastes before discharging to the City sanitary sewer system. Pretreatment requires that an oil/water separator be installed and maintained on site. Oil/water separators for commercial/industrial processes must be sized on a case-by-case analysis of wastewater characteristics. Typically a minimum capacity of 750 gallons is required for small gas stations, auto repairs, and light commercial sites; 1500 gallon capacity for large-scale truck washing and steam cleaning facilities. The ultimate discharge must be directed to the sanitary sewer system. All units regardless of size shall be fitted with a standard final-stage sample box and spill-absorbent pillows. Oil/water separators shall be commercially manufactured and sized for the intended discharge rates for the facility where it is to be installed.

4.3 Sewage Lift Station Impacts.

A written report shall be submitted for any project that will create a new sewage lift station or will contribute to an existing sewage lift station. The report for a new sewage lift station shall contain, but not be limited to, the following:

- a description of the proposed wet well, pumping system, and force main.
- the capacity of the recommended pumps and potential for future upgrades.
- a map showing the potential lift station service area.
- the average and peak design flows for the proposed project and for the potential service area.
- the hydraulic capacity of the force main.
- the reserve capacity of the lift station when the proposed project is on line at full capacity (full build out).
- the pump run and cycle times for the average and peak design flows.
- strategies for improvements which may be necessary to accommodate future sewer extensions. (i.e., increased storage, pumping or auxiliary power capacity)
- a statement of the pump selection process, including the Engineer's calculations for the total dynamic head, total discharge head, net positive suction head, and other pertinent pump selection criteria.
- the designed pump operating curve plotted on a manufacturer's pump performance chart with the designed operating point clearly identified.

The report for a project that will contribute to an existing sewage lift station shall contain, but not be limited to, the following:

- a description of the existing wet well, pumping system and force main.
- the capacity of the existing pumps and potential for future upgrades.
- a map showing the potential lift station service area.
- a list of the existing users and their average design flows.
- the existing peak design flow and reserve capacity.
- the pump run and cycle times for the existing average and peak design flows.
- the hydraulic capacity of the force main.
- the proposed average and peak design flows to the lift station.
- the reserve capacity of the lift station with the proposed project on line at full capacity.
- the pump run and cycle times for the proposed average and peak design flows.
- recommendations for improvements, if necessary, to enable the lift station to serve the proposed project.

An emergency power supply will be required for all lift stations unless approved by the Public Works Director. Upon request from the Director of Public Works/City Engineer, the Design Engineer shall submit a list of three lift stations of the type proposed which have been in operation at least five years. The City reserves the right to accept or reject the proposed lift station.

An alarm system shall be provided that is capable of detecting power interruption, phase loss, low water, motor failure, seal failure (motor moisture sensor), high water, and high motor temperature conditions. The alarm signals shall be directed to an on site alarm monitoring and telephone dialer system. The alarm monitoring and telephone dialer system shall be a 1400 Sensaphone or approved equal. An hour meter is required on each pump. Amperage meters are required on each leg of the electrical wiring. Surge/Lighting protection is required on all control panels. Cathodic protection is required for all lift stations having a metallic exterior. The Engineer shall submit an analysis of the amount of cathodic protection required.